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presents the same regular and remarkable features for 5 miles, when a singular sandstone peninsula, rising perpendicularly from the sea, appears to terminate on the coast the regularity of the stratification.

The country had the same rich and beautiful appearance and seemed more thickly inhabited and better cultivated than to the eastward.*

VI.—*Successful Journey to the Karakorum Pass, in Central Asia.*

By THOMAS THOMSON, M.D., Assistant-Surgeon on the Bengal Establishment, and Commissioner to Tibet. In Extracts from a letter from Kashmir.

[Read Jan. 22, 1849.]

“ You know that my intention in proceeding to the northward from Le was to visit the highest part of the mountain range lying between Ladakh and Yarkand. My road was, therefore, that followed by the merchants who trade between these two countries, who are the only travellers on this route, Yarkand being subject to the Chinese government, whose system of seclusion is there in full force. Early in spring and late in autumn, the merchants, after crossing the mountain range to the N. of Le, follow the course of the Shayok river; but a great part of the course of this stream is deep and rocky, so that from June till October it cannot be forded, and hence during these months this route is impracticable, and another shorter but very mountainous road takes its place. I scarcely know how to explain this road without a map. It ascends what I have for convenience called the Nubra Valley, viz., that of a large tributary, which having been visited both by Moorcroft and Vigne, is laid down in the maps, and thence strikes across the mountains in a N.E. direction, till the Shayok is gained in the upper part of its course, above the unfordable part. In Vigne’s map there is a fancy sketch of this route laid down in it, though it is made much farther from Nubra to the Shayok than it actually is.”

“ *Kashmir, October 8, 1848.*

“ I have thus (as my last letter was written on the 7th of August) a journey of two months to give you an account of. This has been the most novel as well as the most interesting

* The quality of the coal found at Formosa has been found good, having undergone an analytical examination at the Museum of Economic Geology; but the value of the discovery, in a commercial point of view, is diminished at present by the expense of freightage. Lieut. Gordon had it placed on board the *Royalist* for 6s. per ton, while the cost of delivery at Hong Kong would be 2*l.* per ton, and English coal at the same place sells for 1*l.* 8*s.*—ED.

and important part of my travels, and will be better explained by the enclosed map than by any lengthened description. My letters were written from Panamik in Nubra. On the 8th of August I started, making two marches along the valley. On the 10th I entered the mountains, making an abrupt ascent over bare granite rocks of 4500 feet, and descending into a valley not quite 1500 below the top of the ridge. The valley, you will see, enters Nubra below where I left it, but its lower part is quite impracticable. On the 11th and 12th I ascended this valley, which was rather open and fearfully stony. The ravines on both sides contained glaciers, and near my camp of the 11th of August a very large one just entered the valley, terminating at a little below 15,000 feet. On the 12th I was as high as 16,800 feet, among large patches of snow, and on the 13th I crossed the Sassar Pass, and descended into the valley of the Shayok. The pass was over an immense glacier, and several other smaller ones were crossed, which were very laborious, because, entering the main valley from lateral ones, they just crossed it, but did not extend any way down it; at every lateral valley, therefore, I had to climb over a huge mass of ice, descending in the intervals among huge masses of stones. The pass I did not measure, but I guess it rather under 18,000 feet. The descent to the Shayok was very abrupt, first over the glacier, then over huge moraines, the leavings of the glacier when it extended farther down. My camp at Sassar, as this place is called by travellers, was 15,500 feet, and the bed of the river, wide and gravelly, was about 500 feet below me. The country was quite desert, but both on the pass and round Sassar I got many plants of interest. In spring and autumn the Shayok valley is practicable, and the Yarkand merchants take that road, instead of the one I followed, but it is not available till the middle of October or thereabouts, the water being too deep to be forded. A few miles above Sassar two very magnificent glaciers descend from the mountains, and completely cross the bed of the stream, which runs below them. The first of these I got across, though it was very rough and uneven, and the passage of the moraine of loose stones, which on either side rose 50 feet higher than the surface of the glacier, was attended with much difficulty. The second glacier was, however, reported quite impracticable by men whom I sent on purpose to examine it. The road to Yarkand till 10 years ago, when it was blocked up by these glaciers, lay up the Shayok. Now it has become necessary to follow a more circuitous route. Halting on the 14th at Sassar (on which day there was a smart fall of snow), on the 15th I crossed the Shayok, ascended a ravine on its right

bank, and through an open valley, which was, though with very little ascent, a pass; the stream at the beginning ran west, terminating before half-way, when another sprung up running E. This I followed to its junction with a larger stream, near which I encamped. On the 16th and 17th I ascended this stream, which, after a few rocky places, at first ran through a wide, gravelly valley, with high mountains and numerous glaciers in the ravines. On the 18th of August I found that the road left the valley, which had become narrow and rocky, and making a short, steep ascent up a gravelly ravine, I suddenly emerged upon a wide, open, somewhat undulating, gravelly plain, extending 8 or 10 miles; and on looking south, I perceived a continuous range of lofty snow mountains, extending uninterruptedly as far as the eye could reach E. and W. Through these I had evidently passed while following the river bed on the 16th and 17th. The northern part of this plain (the elevation of which averaged about 17,500 feet, and rose in parts to near 18,000, so that it is, I presume, the *highest flat plain on the globe*) was excavated into a wide, open valley, the bed of which may have been 17,000 feet, and which was traversed by a small stream running from E. to W., and, as I was informed, joining the Shayok. The mountains to the N. were rounded, not very high, and almost free from snow. On the 18th I encamped at the edge of this plain, and on the 19th proceeded to the top of the pass, which was the limit of my journey. I found the road up an open, stony valley, terminating in a snow-bed; but long before reaching that, I turned abruptly to the right, and after a short, steep climb over bare stones, found myself on the top of the pass, height 18,604 feet. It was quite free from snow, but on the slopes above there were large patches in shady places, but no continuous snow-beds. To the N. a small stream, commencing just below the pass, could be traced for about half a mile; at the end of which distance it disappeared among hills, by which the view is limited. Along this small stream I was informed the road to Yarkand lay, but through an absolutely desert country, so that I had determined for this and other reasons not to attempt to go farther. First, this portion of the country was thoroughly barren, and I knew that on the edge of the habitable portion was a Chinese post, where I should have been stopped, if not seized. Secondly, from Nubra there is no subsistence for man or beast, and even fuel is barely procurable above 17,000 feet. Thirdly, I was suffering very much from the effects of the rarity of the air, which acts with great severity on me, producing constant head-ache, always worst at night. I think I have determined the points of most interest

both geographically and botanically. The remainder will be done some day from Yarkand, but cannot till the Russians take it from the Chinese.

"The natives of Ladakh and Nubra have no name for the extensive range of snowy mountains which runs from E.S.E. to W.N.W., the snowy peaks of which I estimate to be at least 24,000 feet, and in general these names are confined to localities (towns or encamping places); even rivers have no general names. The name Karakorum is confined to the range N. of the table-land, and in particular to the pass which I ascended. This range, which probably nowhere exceeds 20,000 or 21,000 feet, seems an offset from the snowy range, 20 or 30 miles farther W. It is curious, that though much lower than the range farther south, it is in fact the dividing range between the central or Yarkand basin and the basin of the Indus, several streams breaking through to get to the Indus. Darwin, I recollect, observed a similar circumstance in the two parallel chains of the Andes. The table-land is, as far as I recollect, the *most elevated plain in the world*. It is highest to the W., but must there dip suddenly to the valley, or rather ravine, of the stream which I had ascended, as that runs between it and the snowy range. To the E. it sinks very gently, almost imperceptibly, and it is bounded by low mountains 5 or 6 miles off—the average elevation of the plain is probably about 17,500 feet; and a low range of hills, which occupy its northern border, before the descent to the Shayok, may attain a height of 18,000 feet. Its surface is covered with small, water-worn, and angular fragments of all the surrounding rocks, and its substance seemed to consist of a hardened calcareous clay, of which masses also occurred, rolled on the surface. The rock, where visible, is limestone. Altogether, the general features at once suggested the idea of the bed of a lake, and I have hardly any doubt that such is the explanation of this very curious tract of country. North of the plain limestone reappeared, alternating with slate, and covered with alluvial clays and conglomerates.

"Botanically, I made many acquisitions during this journey, but principally in the earlier part, between Nubra and the Shayok. The species were many of them new to me, but the forms almost entirely those of Europe and North Asia. Many Cruciferæ, especially *Draba*, *Astragali*, *Saxifrages*, *Gentians*, *Lychnis*, *Cerastrum*, *Thalictrum*, *Papaver*, *Potentillæ*, *Sibbaldia*, &c., with *Carices* and grasses. The most curious plant was a species of *alsine*, which formed extremely dense and hard tufts a foot or more in diameter. It began to appear about 15,700 feet, and continued to 18,000. On the table-land the only plant which occurred was the dense, tufted

alsine, large green patches of which were common. I except the bank of a small streamlet, which produced a specimen or two of the common species, showing that want of water alone was the cause of their absence on the plain. The pass (of Karakorum) was also perfectly dry, a mass of stones without a vestige of vegetation, phenogamous or cryptogamous; nor did anything of the kind appear till at least 500 feet below, and close to the bottom of the valley. Here a purple-flowered crucifera was highest. The whole number of flowering plants which rose above 17,000 feet was 16.

"I returned by the same route, and reached Nubra on the 2nd of September. It was originally my intention to descend the Shayok, but I found no prospect for more than a month of doing so, and I could not afford to remain so long."

Dr. Thomson reached Le on the 11th of September, and left it on the 13th, taking the most direct road to Kashmir, which city he reached on the 5th of October, in time to study the natural history of that interesting valley before the close of the season.

VII.—*Report on the River Nunez, its Trade and Resources.* By Lieut.-Commander THOMAS LYSAGHT, R.N. (Communicated by the Admiralty.)

[Read 22nd January, 1849.]

AT present about fifteen to twenty vessels, averaging from 200 to 300 tons, visit the river yearly. The majority of these are foreign—mostly French. The trade is, however, in the hands of British traders to a great extent, the natives having more confidence in them, and the more respectable French merchants preferring dealing with them to dealing with the petty traders of French extraction. The trade, before the recent troubles, has amounted to as much as 40,000*l.*, two-thirds of the imports being British manufactured goods and salt, the remainder French small wares and German arms. The exports were gold, ivory, hides, wax, and of late a large and increasing quantity of ground-nuts, nearly all of which are for the French market. Coffee of a good quality is grown, but owing to the prevailing low prices is now neglected. A considerable part of the gold and ivory which formerly came down the river finds its way out of the Foulah country by new channels, as by the river Tanunany, Mellacouvi, &c. The slave-trade has entirely ceased in this river, and the great demand for labour in cultivating the ground-nut will probably prevent its revival.

The river banks are inhabited by three distinct races, viz.